

# Advances in Psychiatric Epidemiology: Rates and Risks for Major Depression

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**Abstract:** Over the last decade there has been a marked increase in information on the epidemiology of psychiatric disorders, particularly major depression, in adults living in the community and in families. The ability to conduct large epidemiologic studies of psychiatric disorders is due to improvements in diagnostic precision and reliability in psychiatry and to the development of systematic methods for collecting information on signs and symptoms to make diagnoses. Results from a recently completed epidemiologic survey of psychiatric disorders in five urban communities in the United States and from several large-scale family genetic studies suggest

that major depression is a highly prevalent disorder. It occurs in adults and children, and there is evidence for an increased rate in younger people. The average age of first onset is in young adulthood. Most depressions are untreated. The firm risk factors for major depression include being female; young (born after World War II); separated/divorced or in an unhappy marriage; and having a family history of major depression. There is a two-to-threefold increased risk for major depression if there is a family history of the disorder. The relevance of these findings to clinical practice and public health is discussed. (*Am J Public Health* 1987; 77:445-451.)

## Introduction

In the last decade there has been a marked increase in information on the epidemiology of major psychiatric disorders in adults and families, including data on the rates of psychiatric disorders and who is at increased risk for these disorders. This increase in information is due to the achievements in clinical psychiatry such as the development of measures to obtain more precise and reliable diagnoses and the development of methods to collect information on signs and symptoms to make diagnoses. The methodologic work required to conduct these studies was undertaken between 1975 and 1980. Since most of the substantive studies were only begun about six years ago, the major information is still forthcoming. This forthcoming information has both clinical and public health value and has generated a new dialogue between psychiatric epidemiologists and clinical psychiatrists.

This paper will illustrate these developments using data on major depression. Major depression has been selected because it is one of the most common disorders, it has a high morbidity,<sup>1</sup> and it is largely untreated.<sup>2</sup> There is evidence from many well-designed clinical trials for the efficacy of a wide range of treatments, both pharmacologic and psychologic.<sup>3</sup> Thus, if untreated populations and persons at high risk for the disorder can be identified, there is opportunity for treatment and for prevention of disability and recurrence. Moreover, many of the findings and implications for the affective disorders are similar for the anxiety disorders and for substance abuse.

## History

There is a long history of endeavors to investigate the epidemiology of mental disorders in the United States.<sup>4,5</sup> The first survey of psychiatric disorders, in 1855 is attributed to Dr. Edward Jarvis. Idiocy and insanity were the nosological distinctions. There have been other "golden eras" in psychiatric epidemiology. For example, pellagra at the turn of the century accounted for 10 per cent of admissions to mental

hospitals in the South. The classic work of Goldberger in 1914, using a case-control method and careful observation of patients in mental hospitals, demonstrated that pellagra psychosis was due to nutritional deficiency.

The period after World War II, during the 1950s and 1960s, was also one of high activity in community surveys of mental impairment and health. The classic epidemiologic studies of this period included the work of Hollingshead and Redlich,<sup>6</sup> which showed the relation between social class and mental illness, as well as the important studies of Leighton and associates in Nova Scotia,<sup>7</sup> Srole and associates in Manhattan,<sup>8</sup> and Myers and Bean in New Haven,<sup>9</sup> which demonstrated the effects of poverty, urban anomie, social stress, and rapid social change on rates of impairment.

Although psychiatric epidemiology flourished in the post-World War II period, with some notable exceptions the studies of that period used measures of overall mental impairment rather than specific diagnoses. The impairment rates that were reported were independent of diagnosis and could not be translated into equivalent clinical diagnostic categories. These studies also showed high rates of impairment. From the point of view of policy, if so many persons were affected, the possibility of interventions seemed unlikely. As a result, rates of treated and untreated specific psychiatric disorders, based on the same diagnostic criteria used in clinical practice, were not available in the United States in the 1970s. Large-scale studies of families were lacking. There was a separation between psychiatric epidemiology and clinical psychiatry.

Among the major achievements in psychopathology in the last decade that have enabled psychiatric epidemiologic studies of clinical value and have bridged the gap between psychiatric epidemiology and clinical psychiatry are: 1) specified diagnostic criteria;<sup>10,11</sup> 2) improved diagnostic reliability; and 3) standardized methods of assessing signs and symptoms of psychiatric disorders by direct interview<sup>12,13</sup> or by family history.<sup>14</sup>

In the late 1970s, these techniques began to be applied to large samples of communities and families to answer questions about rates and risk factors for psychiatric disorders. The data are only now becoming available.<sup>15</sup> These studies include:

- The National Institute of Mental Health (NIMH) Epidemiologic Catchment Area Study (ECA), in which university research teams have surveyed over 18,000 persons selected from probability samples of non-insti-

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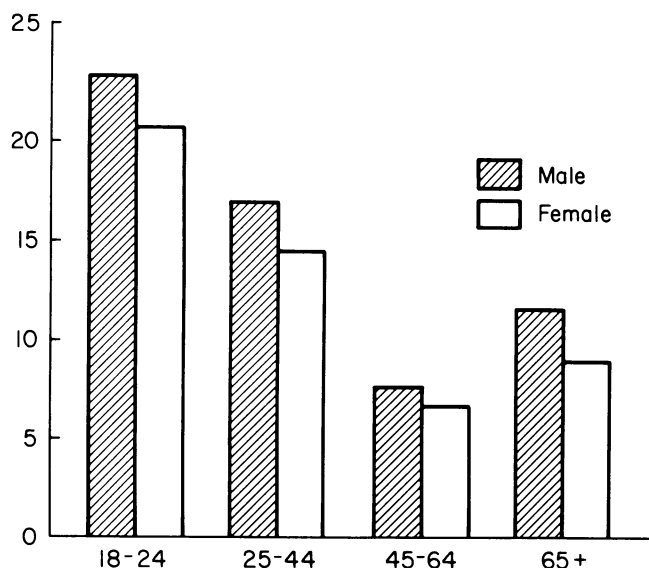


FIGURE 1—Six-month Prevalence Rates/100 any DSM-III Disorder, New Haven, CT

tutionalized persons living in five urban areas in the United States: New Haven (Yale), Baltimore (Johns Hopkins), St. Louis (Washington University), Durham (Duke), and Los Angeles (UCLA). The study's purpose was to determine the rates and risks for major DSM-III disorders and the treatment received for these disorders.<sup>16,17-19</sup> Longitudinal data over one year and samples of institutionalized persons have also been collected.

- Large family genetic studies of adult and child relatives of patients with affective disorders to determine the familial risk of psychiatric disorder.<sup>20-23</sup>

These independently conducted studies in the community and in families, using similar diagnostic criteria and comprising samples of more than 20,000 persons from different parts of the United States, are beginning to yield a new perspective on psychiatric disorders.

Increasingly, these studies of psychiatric disorders resemble approaches which have been applied successfully to the study of other chronic diseases such as cardiovascular disease, hypertension, or diabetes.<sup>24,25</sup>

#### Epidemiology Catchment Area Study (ECA)

##### Magnitude of Psychiatric Disorders

The full details of the ECA study have been presented elsewhere.<sup>16-19</sup> As of 1985, data had been published on three of the five sites, and informal presentations of the preliminary data on all five sites had been made.

The first achievement of the ECA study has been to demonstrate the magnitude of psychiatric disorders in the community as well as the consistency in findings between sites for most disorders.<sup>17</sup>

- Overall, approximately 14/100 men (13.1/100–15.7/100) and 12/100 women (11.6/100–13.2/100) experience a DSM-III Axis I disorder in a six-month period. The rates are comparable between the sexes.

- Figure 1 displays the rates by sex and age in New Haven; the rates are comparable in Baltimore, and St. Louis.

- The age of highest risk is 18–44 years, and particularly 18–24 years.

- Preliminary findings presented by Regier in a paper

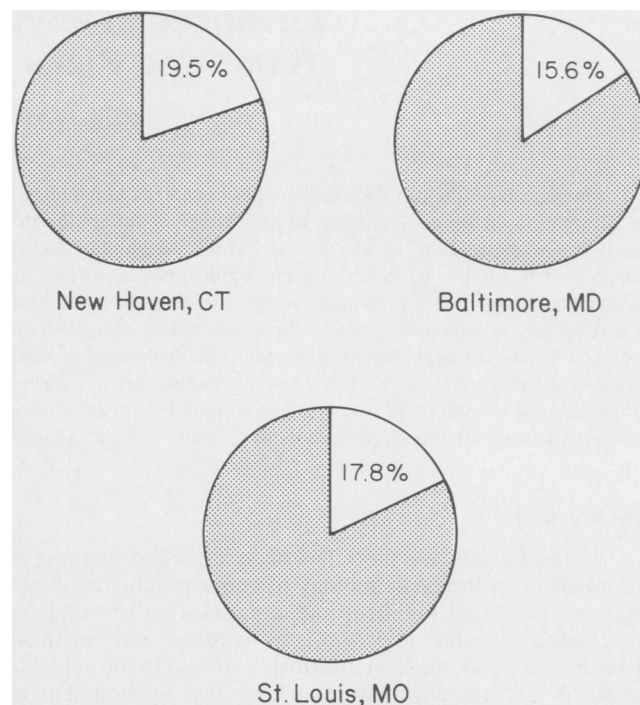


FIGURE 2—Proportion with Mental Health Visits in past Six Months for Persons with a Recent DSM-III Disorder

SOURCE: Shapiro, et al<sup>19</sup>

read at the American Psychiatric Association Annual Meeting in Dallas, Texas, May 1985, show that the overall rates of disorders are comparable in the last two sites (Piedmont area of North Carolina, and Los Angeles, California).

##### Magnitude of Psychiatric Disorders in Treatment

Figure 2 demonstrates the importance of community samples to obtain rates of psychiatric disorders. Presented are the proportions of mental health visits in the past six months to any sector of the health care system by persons with a recent DIS/DSM-III disorder.<sup>19</sup> Slightly less than 20 per cent of persons with any psychiatric disorder in the past six months seek treatment for it from any mental health professional.

##### Rates of Specific Disorders

In regard to the most prevalent specific disorders (Table 1):

- The rates are highest for anxiety disorders (primarily phobias); affective disorders (primarily major depression); and substance abuse (primarily alcohol abuse).

- The rates are comparable in all sites with the exception of phobia in Baltimore.

- Not shown here, the most common disorders among

TABLE 1—Six-Month Prevalence Rates/100—ECA

DIS/DSM-III	New Haven	Baltimore	St. Louis
Anxiety Disorders	7.2	14.9	6.6
Affective Disorders	6.5	4.6	6.2
Substance Abuse	6.1	7.2	5.8
Any DIS Disorder	15.2	14.0	13.8

Data obtained from Myers, et al.<sup>20</sup>

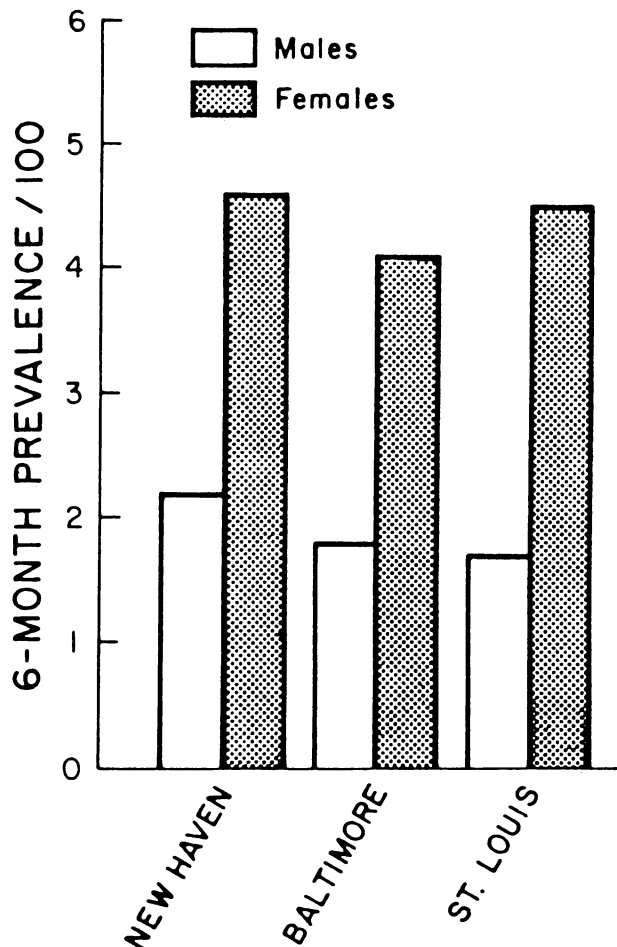


FIGURE 3—Major Depression DSM-III: ECA

young men (ages 18–24 years) are alcohol abuse, drug abuse, and phobias. Among young women, phobias, drug abuse, and major depression are most common. The affective disorders (major depression) are most prevalent in ages 18–44 for both men and women.

#### Risk Factors for Major Depression

Figure 3 shows the rates of major depression by sex in three ECA sites, as well as the similarity in rates across the sites and the increase in rates among women. The higher rate of major depression in women is consistent with many previous clinical and epidemiologic studies.<sup>26</sup> Figure 4 shows the age and sex distributions of major depression in the New Haven site.<sup>27</sup>

As can be seen, major depression is most common in young persons ages 18–44, and particularly ages 25–34. The sex ratio is 2 or 3 to 1. Women ages 18–44 have by far the highest rates.

There is evidence that the age of onset of major depression is decreasing and that there is a birth cohort effect (Figure 5). Observations regarding a birth cohort effect were first made by Klerman in 1975<sup>28</sup> and later were demonstrated in a family study<sup>29</sup> and in several other studies.<sup>30–33</sup> The age of onset of major depression seems to be declining and the rates are increasing in the cohort that came to maturity after World War II—the cohort born after 1935. Preliminary ECA

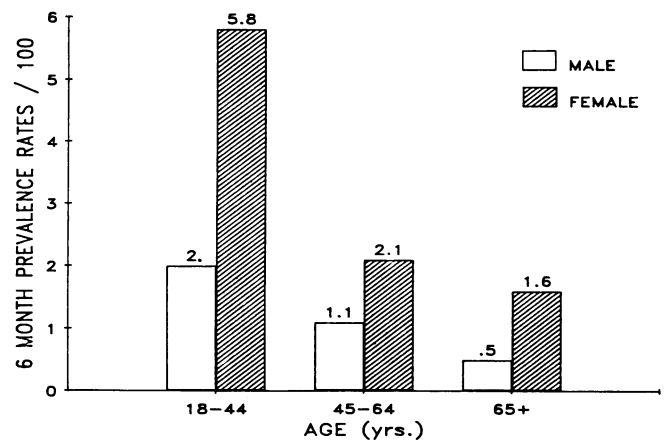


FIGURE 4—Major Depression: ECA-New Haven, CT

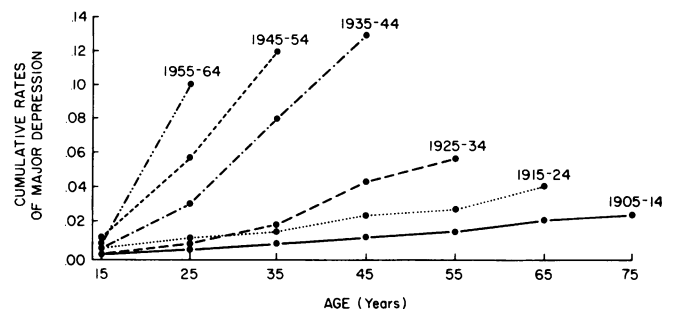


FIGURE 5—Cumulative Rates of Major Depression by Cohort, New Haven, CT

results suggest that this finding is consistent across all five sites.

The same pattern was also observed in a small epidemiological survey conducted in 1975 in New Haven, Connecticut,<sup>32</sup> and in a 25-year longitudinal survey in Lundby, Sweden.<sup>33</sup> Similar patterns have been shown in two large family studies of the first-degree relatives of affectively ill probands.<sup>30,31</sup> While Murphy and associates<sup>34</sup> have reported stable prevalence rates, the birth cohorts in their study do not include the most recent cohorts who may be experiencing the rise in rates. While other explanations (e.g., memory effects, selective survival, changes in labeling of illness) could account for the apparent change in rates, the consistency of the findings suggests that the increase is real.

For the clinician or the public health worker this means they can expect to see a greater number of younger persons who are affected with major depression and whose age of first episode is younger than previously seen in other eras. The mean age of first onset is in the twenties. We do not know the rates of psychiatric disorders among children in the community in the United States.

In regard to other risk factors for major depression, the rates are lowest in men and women who are married and getting along with their spouse, and highest in married women in unhappy marriages (Table 2). While women have higher rates of depression than men, the increased risk for major depression in an unhappy marriage is nearly the same for men and women, about a 25-fold increase.<sup>27</sup> The direction of this association is not clear.

There is evidence that depression equally affects the educated and uneducated, the rich and poor, White and Black

**TABLE 2—Six-Month Prevalence Rates/100 Major Depression, ECA- New Haven**

	Male	Female
Separated/Divorced	4.4	6.3
Single	2.4	3.9
Married—gets along with spouse	0.6	2.9
Married—doesn't get along with spouse	14.9	45.5
	Odds Ratio	
Odds of Major Depression for those who say they don't get along with spouse	25.8	28.1

Odds Ratio adjusted for age.

Americans, blue and white collar workers.<sup>27</sup> The rates are lower in rural areas.<sup>35</sup>

In summary, the ECA has defined clear risk factors for major depression: being female; young; born after World War II; divorced, separated or having marital discord. However, there are many other risk factors that have not been studied. Family history may prove to be among the most powerful.

#### *Family Genetic Studies*

##### **Family Studies of Adults**

Evidence from several large, well-designed family studies shows the importance of the family as a risk factor for major depression in both adults and children.<sup>20,36-38</sup> There is a long history in psychiatry of interest in the family. Family psychiatry has been heavily influenced by the interpersonal approach, which looks at quality of family relations, conflicts, dynamics, and/or systems.

There is emerging a hybrid discipline—genetic epidemiology—which also is interested in the family and which studies the cause of familial resemblance of disorders. As noted by Morton and Chung, "Genetic epidemiology is concerned with the etiology, distribution and control of disease in relatives and with inherited causes of disease in populations. Inherited . . . in a broad sense includes both biological and cultural inheritance."<sup>39</sup>

The increasing collaboration of epidemiologists and geneticists in studies of families with psychiatric disorders is beginning to yield considerable information on another important risk factor for major depression, namely, family history of the disorder. The typical design of these studies is one in which a depressed proband is matched to a well or nonpsychiatrically ill proband. The psychiatric status of the biological first-degree relatives (i.e., parents, siblings and children) of ill and well probands are studied blindly as to the clinical status of the identified probands.

There is now emerging a technology of family studies, including: systematic approaches to obtaining pedigrees,<sup>40</sup> and methods of obtaining family history when direct interviews with relatives are not possible.<sup>18</sup> Such techniques have improved the quality of these studies and are quite applicable to ordinary clinical practice.

The results from these family studies consistently show that major depression is highly familial. There is a two-to-threefold increase in major depression in the first-degree adult relatives of probands with major depression, as compared to the relatives of non-ill controls.<sup>36</sup> Moreover, the earlier the onset of the major depression, especially the onset under age 20, the higher the familial loading.<sup>41</sup> Clinicians treating patients with an onset of major depression in childhood or adolescence can expect that other members of the patient's family are likely to be ill. Also, the relatives

themselves are more likely to have major depression with an early onset.

Assortative mating in these families is high—a depressed patient is frequently married to a depressed spouse. Where there is evidence of assortative mating, there is increased risk of marital problems in the couples and psychiatric problems in the children.<sup>42</sup>

The data thus far have dealt with the adult relatives of depressed patients. Increasingly, attention has turned to the children. The absence of studies of major depression in children has been based on the belief that depression did not occur in children. As noted by Dr. Puig-Antich,<sup>43</sup> affective disorders were not mentioned in any child psychiatry textbook until 1976. During the 1970s, the feasibility of using unmodified adult research diagnostic criteria for major depression in child and adolescent patients was confirmed by a number of investigators in the field.<sup>44</sup> This view has been adopted by the DSM-III. There are now several ongoing prospective studies of children from families at risk of depression.<sup>45-48</sup>

#### **High Risk Studies of Children**

In a high-risk study, the identified proband is the ill parent. All of the children (age 17 years or younger) of the proband are usually studied longitudinally in order to determine both the rates of illness, in the past and over time, and the factors which are associated with the development of new episodes of illness in the child. Control groups include the children of well probands who either were never psychiatrically ill or were psychiatrically ill with a disorder other than depression.

A high-risk design has several advantages. Since the children are studied longitudinally, information on the early signs and first episodes of the illness, unconfounded by chronicity, can be obtained. These studies are often considered useful for developing strategies for early detection of illness.

While most of the past high-risk studies were on children of schizophrenic parents,<sup>49,50</sup> there are currently under way several excellent studies of children at high and at low risk for depression.<sup>38,45</sup> The results of these studies show high rates of depression in children ages 6-17 of depressed parents. As with the adults, there is a two-to-threefold increase of major depression in these children. Moreover, the children report more depression when asked directly themselves than do their parents when asked about the children. The parents are not always aware of the extent of their children's illness.

Anxiety disorders and alcohol/substance abuse are also increased in these children and, again, the parents are unaware of the extent. The children's problems are apparent in all aspects of their lives with friends, siblings, in school. The long-term significance of these clinical states in children and their continuity into adulthood is unknown. The prospective studies will yield this information.

#### *Clinical Implications*

The emerging epidemiologic evidence suggests that clinicians should be alert to, and take seriously, the reports of depression in young people and in children. While the segment of the population which is young is declining with the declining birth rate, this is still a population likely to seek treatment from psychiatrists and mental health professionals. Moreover, the elderly use psychiatric services at a far lower rate than younger persons and usually receive their treatment for mental disorder in the general medical sector. While the

population as a whole may be aging, the persons in psychiatric treatment for depression may be younger if current trends continue.

The increasing attention, in the popular press to childhood, adolescent, and young adult depression is probably a reflection of a real increase in rates. Clinicians treating adults will need to be increasingly aware of the growing information on the risks and familial nature of depression. As these genetic-epidemiologic findings come to the attention of the lay press, especially the information on familial loading of major depression, clinicians can expect to see increasing requests for genetic counseling of the younger patient. A question such as "My fiancée's family is loaded with relatives who are on tricyclics—what does this mean?" may not be uncommon.

### *A Family Perspective*

The familial nature of depression probably has the most relevance for clinical practice and for public health. The importance of the family has a long tradition in mental health disciplines. The epidemiologic data suggest the need for an additional perspective on the family—one which takes into account the specific psychiatric disorders of the individual family members (i.e., the first-degree biologic relatives including children) as well as the spouse.

There are new techniques for systematically and efficiently collecting and drawing pedigrees which are readily available to the clinician.<sup>40</sup> Following the identification of the family member in the pedigree, there are methods for obtaining family histories of lifetime psychiatric disorder in these relatives without directly interviewing the relative. Direct interview with relatives also may be indicated at a later time. Systematic inquiry into *lifetime diagnosis* of family members, both adults and children, can be obtained from the patients using the family history assessment method. Family-history accounts will nearly always underreport mild psychopathology in relatives, and they should be considered as clues or as a screen.<sup>51,52</sup>

For direct psychiatric examination of the patient and/or family members, one of the several structured diagnostic interviews available for making RDC or DSM-III diagnoses should be considered. They are easy to learn and can readily become a routine part of clinical practice. They have comprehensive coverage of most DSM-III, Axis I diagnoses and are being developed for Axis II.<sup>53</sup> Most of the structured interviews for diagnostic assessment can be administered by a health professional and, with brief training, do not require psychiatric or medical education.

The lifetime as well as current perspective on psychopathology is useful, e.g., a past history of alcohol abuse, panic disorder, or mania has important implications for treatment planning. There are methods for assessing psychiatric diagnosis in adults and in children age 6 years or older.<sup>54-56</sup> Similar methods for children younger than age 6 are not available. These diagnostic interventions can be administered to parents about their children, although underreporting of the children's symptoms, and especially of the adolescents' symptoms, should be expected.

### *The Future*

The epidemiologic data suggest that the clinical challenge of the 1990s for both adult and child psychiatrists will be the diagnosis and treatment of children, adolescents, and young adults, and the careful assessment of specific psychi-

atric diagnoses over a lifetime of a patient's individual family members. The findings point to the direction of opportunities for improving early detection and care, and reducing the distress of new populations. While the risks associated with major depression cannot be readily modified as in the example of diet, smoking, or exercise in cardiovascular disease, they can, however, alert the clinician to high-risk persons and situations. Knowledge of these risks suggests opportunities for early intervention.

The new technologies of family pedigrees and diagnosis of specific disorders in individual family members provide tools for early case finding of at-risk populations. Fortunately, for major depression, a range of treatments are available.

The current limitations of epidemiology in psychiatric research are limitations inherent in our understanding of psychiatric disorders. Psychiatric diagnostic classifications are based on manifest criteria rather than etiology. While the reliability of psychiatric disorders has improved considerably, the validity for most diagnoses has not been established. No biological risk factors have been unequivocally demonstrated for any of the disorders. Psychiatric disorders like many chronic diseases are undoubtedly due to many causes. Even for some forms of depressive disorders, where genetic heritability is supported by twin and adoption studies, a large part of the variance is unaccounted for.

These limitations, however, are a challenge to the development of epidemiologic designs which can yield testable hypotheses. As discussed by Jablensky,<sup>57</sup> many research designs in biologic psychiatry have low statistical power, ill-conceived controls and samples of convenience. The result is a host of unreplicated studies. Alternately, epidemiologic studies have not proceeded beyond demonstrating a range of demographic (sex, age, social class) variables associated with major mental illness which do not elucidate the mechanism by which the factors operate. Clearly, there is a need to integrate the search for biological markers and risk factors. Epidemiologic and clinical research in psychiatry also have much to be gained by a partnership.<sup>58-61</sup> A host of unreplicated biological studies could be avoided by careful attention to sampling, diagnostic assessment, and use of appropriate comparison groups. These concerns are the basis of epidemiologic methods. Alternately, the integration of epidemiology with clinical practice may reduce the number of well-designed epidemiologic studies with findings of little utility to the health of sick people.

The epidemiologic data presented come from very recent studies, some not fully completed. Over the next five years, a wealth of information will be emerging from these studies which will have relevance for improving clinical care. The dialogue between the psychiatric epidemiologist and the clinician has begun. This dialogue, as suggested by others,<sup>61</sup> will lend both a public health perspective to clinical practice as well as clinical relevancy to the epidemiologic phenomena studied.

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### Vision Care Section of APHA Announces Call for 1987 Awards Program

The Vision Care Section of the American Public Health Association has announced its awards program for 1987, and solicits nominations in the three categories of awards: distinguished achievement; outstanding student; and outstanding paper or project.

- The *Vision Care Distinguished Achievement Award*, the highest honor bestowed by the Vision Care Section, is designed to recognize the leaders in vision care public health. This annual award is presented to an individual who has made an outstanding contribution to the field or demonstrated continual high quality service in the area of public health vision care.

- The *Vision Care Outstanding Student Award* gives recognition to a student who has demonstrated ability in the promotion of vision care in the public health field. The selection of the recipient is based on demonstrated accomplishments or an outstanding paper in the field of vision care public health. Neither academic credentials nor grades will be a factor in selecting the awardee.

- The *Outstanding Paper/Project Award* is designed to recognize an individual, institution, or group that has contributed significantly to the advancement of vision care in the field of public health. The contribution can be a paper, either previously published or suitable for publication, or a written description of a project. Paper/projects should represent work (within the last two years).

Faculty members and vision care students are especially requested to submit nominations for the outstanding student award and the outstanding paper/project award. All award recipients will receive a commemorative plaque at the annual APHA meeting, to be held this year in New Orleans, October 18-22, 1987. The recipient of the Outstanding Paper/Project Award will have the opportunity to present the paper or project during a session at the APHA annual meeting.

Nominations should include a narrative statement of 250 words or less, and should be sent by May 15, 1987 to: Joan Stelmack, OD, Awards Committee Chair, APHA Vision Care Section, c/o Hines Veterans Hospital-Blind Rehabilitation Service, Building J3, Hines, IL 60141. Tel: 312/343-7200, ext. 2275.